HAMSTRING MUSCLE LENGTH AND PELVIC TILT RANGE IN INDIVIDUALS WITH AND WITHOUT LOW BACK PAIN

By

FASUYI, FRANCIS O.

Email: tfunsho@gmail.com
Phone no: +2348036142519

INTRODUCTION

- Forward bending (FB) = lumbar flexion + pelvic rotation.
- Poor hamstring flexibility = limit FB unless compensated for by increased lumbar flexion.
- Lumbar flexion a developmental factor of low back pain (LBP).

STATEMENT OF PROBLEM

- No relationship between HML & PTR in Static standing (Mohammed et al, 2002; Kendall et al, 2005)
- Previous researchers have suggested no relationship exists during static standing (Nourbakhsh& Arab, 2002; Congdon et al, 2005)
- What will be the relationship in FB?

OBJECTIVE

- To compare each of HML and PTR in individuals with and without LBP
- To investigate relationship between HML and PTR in the two groups during FB

SIGNIFICANCE

- This study showed that no causal relationship exists between HML and PTR during FB.
- It has further given credence to the measurement of HML when evaluating LBP patients.

PARTICIPANTS

- 30 (16 females, 14 males) - LBP group.
- 30 (14 females, 16 males) - without LBP group.

METHOD

- Research protocol: approved by UI/UCH Institutional Research Committee (UI/EC/11/0087).
- Study design - Ex post facto
- Consecutive sampling technique
- HML - active knee extension test (Norris & Matthew, 2005).
- PTR during dynamic FB - Acumar™ Digital Inclinometer (Bierma-Zeinstra et al., 2001)

DATA ANALYSIS

- Descriptive statistic; to summarize data,
- Pearson Product Moment Correlation to investigate the relationship between HML and PTR of the two groups and
- Independent ‘t’-test to determine HML and PTR differences in the two groups with
- Alpha level set at 0.05.

RESULTS

TABLE 1: PHYSICAL CHARACTERISTICS OF PARTICIPANTS

	With LBP (n=30)		Without LBP (n=30)		Calculated t	p-value
	Mean ± SD	Range	Mean ± SD	Range		
Age	53.70 ± 8.62	35 – 70	26.07 ± 5.70	20 – 41	14.65	0.00**
Weight	66.83 ± 9.50	51 – 94	69.50 ± 6.50	52 – 83	-1.27	0.21
Height	1.66 ± 0.08	1.50– 1.88	1.69 ± 0.05	1.54– 1.77	-1.64	0.11

(α = 0.05)
**** = significant difference**
M – Mean
S.D – Standard deviation

RESULTS

- **TABLE 2: COMPARISON OF MEASURED VARIABLES BETWEEN THE GROUP WITH AND WITHOUT LBP**

	With LBP (n=30)		Without LBP (n=30)		Calculated t	p-value
	M ± S.D	Range	M ± S.D	Range		
AKE Test	142.10 ± 8.85	123 – 157	147.67 ± 7.64	133 – 163	-2.61	0.01**
Pelvic tilt	16.20 ± 18.47	-29 – 42	9.00 ± 14.96	-21 – 30	1.66	0.10

(α = 0.05)
**** = significant difference**
M – Mean
S.D – Standard deviation

RESULTS

- **TABLE 3: RELATIONSHIP BETWEEN HAMSTING MUSCLE LENGTH AND PELVIC TILT IN GROUP WITH LBP AND GROUP WITHOUT LBP**

Groups	Pearson Correlation	Significance
With LBP	-0.068	0.722
Without LBP	-0.019	0.919

($\alpha = 0.05$)

DISCUSSION, CONCLUSION & IMPLICATION

- Contrary to previous report (Bellew et al., 2010), no significant relationship exists between HML and PTR in the two groups.
- This study has shown a normal static state of the spine, to dispel the idea of an increase in PTR with concomitant increased lumbar lordosis in patients presenting with LBP.
- Therapist are encouraged to evaluate hamstring flexibility in LBP patients.

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